Chapter 13

How Populations Evolve

Chapter Objectives

Opening Essay

Describe three adaptations that help blue-footed boobies survive.

Darwin’s Theory of Evolution

13.1 Briefly summarize the history of evolutionary thought by characterizing the views of early Lamarck, Darwin, and Greek philosophers.

13.1 Explain how Darwin’s voyage on the Beagle influenced his thinking.

13.1 Describe the ideas and events that led to Darwin’s 1859 publication of The   
Origin of Species.

13.2 Explain how the work of Thomas Malthus and the process of artificial selection influenced Darwin’s development of the idea of natural selection.

13.2 Describe Darwin’s observations and inferences in developing the concept of natural selection.

13.2 Explain why individuals cannot evolve and why evolution does not lead to   
perfectly adapted organisms.

13.3 Describe two examples of natural selection known to occur in nature. Note two key points about how natural selection works.

13.4 Explain how the fossil record provides some of the strongest evidence of   
evolution.

13.5 Explain how biogeography, comparative anatomy, and molecular biology   
support evolution.

The Evolution of Populations

13.7 Define the gene pool, a population, and microevolution.

13.8 Explain how mutation and sexual reproduction produce genetic variation.

13.8 Explain why prokaryotes can evolve more quickly than eukaryotes.

13.9 Describe the five conditions required for the Hardy-Weinberg equilibrium.

Mechanisms of Microevolution

13.11 Define genetic drift and gene flow. Explain how the bottleneck effect and the founder effect influence microevolution.

13.11 Explain how genetic bottlenecks threaten the survival of certain species.

13.12 Explain why natural selection is the only mechanism that consistently leads to adaptive evolution.

13.14 Define and compare intrasexual selection and intersexual selection.

13.15 Explain how antibiotic resistance has evolved.

13.16 Explain how genetic variation is maintained in populations.

13.17 Explain why natural selection cannot produce perfection.